

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of : Ma, et al. Conf. No. 5924  
Serial No. : 10/517,748  
Art Unit : 1793  
Filed : December 13, 2004  
Examiner : Vijayakumar, Kallambella M  
For : **ELECTROCONDUCTIVE CARBON FIBRIL-BASED INKS  
AND COATINGS**  
Mail Stop RCE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION OF HOWARD TENNENT, PH.D.**

I, Howard Tennent, declare as follows:

1. I am a citizen of United States residing at 301 Chandler Mill Road, Kennett Square, PA 19348.
2. I hold the degrees of B.S. and M.S. in Chemistry from Rensselaer Polytechnic Institute and a Ph.D. in Physical Chemistry from the University of Wisconsin.
3. I have been an invited lecturer at California Institute of Technology, Massachusetts Institute of Technology, Stanford University, University of Chicago, University of Wisconsin and University of California Los Angeles.
4. I am a named inventor on a number of patents owned by Hyperion Catalysis, Inc. ("Hyperion") on technologies and inventions pertaining to carbon nanotubes and fibrils. I have worked extensively in the production, characterization and analysis of carbon fibers and carbon fibrils since 1975. I consider myself qualified as an expert in the field of these compositions of matter.

5. Since 1981, I have served as a consultant to Hyperion, the owner of the instant U.S.S.N. 10/517,748 ("the '748 application").

6. I have reviewed the Final Office Action of February 11, 2009 ("Final Office Action") issued in the '748 application. I am familiar with the subject matter disclosed and claimed in the '748 application.

7. I make this declaration in support of the patentability of the invention defined in the presently amended claims 21-23, 26-28, 30-35, 76-78, 81, 82 and 84-89 over the prior art asserted in the Final Office Action.

8. I understand that the Final Office Action has asserted that the Applicants' claimed invention is unpatentable over: (a) the combination of U.S. Patent No. 6,422,450 ("Zhou") with U.S. Patent No. 6,331,262 ("Haddon"); (b) the combination of Zhou with Haddon and U.S. Patent No. 5,853,877 ("Shibuta"); and (c) the combination of Shibuta with Zhou. These conclusions are incorrect.

9. Specifically, as explained below, Zhou's sequence of the process steps are different from Applicants' and thus, Zhou's product is not the same or substantially the same as that claimed by Applicants.

10. Applicants' method for making an electroconductive ink comprises: (a) adding carbon fibrils to a liquid vehicle to form a solution; (b) milling said carbon fibrils in said solution; and (c) filtering said solution to form an electroconductive ink having a viscosity from about 1 to about 50,000 cps and a thixotropic index value from about 1.0 to about 10.

11. Zhou teaches a process comprising: (a) adding the carbon nanotubes to a solvent; (b) dispersing the carbon nanotubes in said solvent; (c) filtering said nanotubes from said solvent to recover purified nanotubes; and (d) optionally milling said purified nanotubes. (Zhou, col. 4, lines 25-52).

12. Nowhere does Zhou teach or disclose an electroconductive ink having a viscosity from about 1 to about 50,000 cps and a degree of thixotropy from about 1.0 to about 10. In fact, Zhou's composition is not an electroconductive ink, but a substance that must be solution-deposited onto a substrate. Zhou's composition cannot be screen printed, sprayed, brushed or dipped onto a substrate like Applicants' electroconductive ink. This is because Zhou's composition does not have both a viscosity from about 1 to about 50,000 cps and a thixotropic index value from about 1.0 to about 10 as recited in Applicant's amended claim 21.

13. This difference in property is unexpectedly caused by two important process differences between Zhou and Applicant's processes. First, in Zhou's process, the milling step (if optionally employed) occurs after the filtering step while in Applicants' process, the milling step occurs before the filtering step. Second, Zhou optionally mills the filtered carbon nanotubes itself, not carbon nanotubes while they are in the solvent. (col. 4, lines 42-51; Fig 2). On the other hand, Applicants' process mills carbon nanotubes while in solution.

14. Thus, Zhou does not disclose, teach or even suggest all of the claimed limitations and does not render obvious the claimed subject matter.

15. Neither Haddon nor Shibuta makes up for Zhou's deficiencies. In other words, the combinations of (a) Zhou with Haddon, (b) Zhou with Haddon and Shibuta and (c) Shibuta with Zhou still fail to teach all of the claimed limitations.

16. Thus, for the reasons set forth above, one of ordinary skill in the art would not consider Applicants' process steps prima facie obvious over the teachings of Zhou alone or in combination with Haddon and Shibuta.

All statements made of my own knowledge are true and all statements made on information and belief are believed to be true. I make this declaration understanding that willful false statements

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and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001) and may jeopardize the validity of the applications or any patent issuing thereon.

Dated: April 22 2009

Respectfully submitted,

By:

Howard Tennent  
Howard Tennent, Ph.D.